NATURAL RESOURCES DEFENSE COUNCIL

M E M O R A N D U M

To: Richard Karney – Department of Energy

From: Noah Horowitz – NRDC Sr. Scientist

Date: May 15, 2003

Re: NRDC's Comments on Energy Star Water Heaters

The Natural Resource Defense Council, NRDC, respectfully submits the comments contained herein in response to the April 16, 2003 Informal Discussion on residential water heaters. NRDC is an environmental advocacy organization with over 550,000 members and a proven track record of over 25 years participating in energy efficiency activities.

Background

In the supporting materials for its April meeting, DOE and its contractor documented the significant energy consumption of residential water heaters in the US, approximately 15% of all home energy use. Given the upcoming new mandatory standard for water heaters in 2004, we concur that the time is right for establishing a meaningful Energy Star specification for water heaters.

From our perspective the water heater market is at a major potential inflection point. The market is currently dominated by standard equipment (electric resistance and gas or oil storage water heaters) with mediocre energy performance. A whole set of next generation technologies --heat pump, solar, and fully condensing gas storage water heaters --that offer dramatic energy savings are available but currently have limited market share due to a range of classic market transformation barriers that exist. We firmly believe that these barriers can be greatly reduced and in some cases eliminated by establishing an aggressive Energy Star spec that promotes these advanced technologies.

Below we provide DOE with our input for developing the specification and some arguments against simply maintaining the status quo.

1. *We recommend DOE pursue a modified version of its Option 4 (Advanced Electrical Technology/Best Performing Gas/Oil Technologies). We recommend setting the Electric Storage level at 1.7 or higher, and the Gas Storage Level at 0.80.*

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For an Energy Star label and supporting specification to be meaningful and credible to consumers, the qualifying products should deliver significant energy savings compared to the base case. As currently proposed, the annual utility bill savings for conventional electric and gas storage water heaters are trivial relative to advanced water heater technologies currently available. We therefore recommend:

a) *Do not allow electric resistance water heaters to qualify for the Energy Star specification*. This technology is inherently inefficient and results in much higher operating costs than any of the other water heating technologies. The proposed levels contained in options 1 thru 3 would yield incremental savings of merely a couple of percent for basic electric storage based systems. To compound the problem, the test method used to assess performance is probably not robust or reliable enough to properly distinguish between qualifying and non-qualifying models.
b) *Increase the proposed electric storage level energy factor from 1.0 to 1.7.* While setting the EF at 1.0 eliminates electric resistance water heaters from qualifying for Energy Star, one could create an unintended consequence of luring poor performing solar water heating systems into the market, especially if significant rebates were offered by utilities.

c) *Increase the gas storage level from the proposed 0.63 to 0.80.* The federal standard for gas storage water heaters goes from 0.54 to 0.59 and the Option 4 proposal for Energy Star is 0.63. This translates to less than a 7% energy savings, much less than the typical savings a consumer receives when buying other Energy Star qualified products. As we will state in other sections, we believe that water heaters merit movement toward the next generation of dramatically more efficient technologies, in this case condensing water heaters that have an EF of 0.80 or greater. The 0.80 level has been incorporated in the tax credit portion of the Energy Bill under consideration by Congress, reflecting significant manufacturer acceptance.

2. *We disagree with the complaint raised by some stakeholders that "the Energy Star specification should not be based simply on the next generation of technologies since their market share is so small, less than 5% of the overall residential water heater market".*

a) DOE has on more than one occasion set an Energy Star specification for a product category with little or no qualifying product available at the time of issuance. Two excellent examples are clothes washers and refrigerators. In the case of clothes washers, DOE set an ambitious Energy Star specification that basically required manufacturers to move to the next generation of product technology and in some cases to create brand new designs. When the spec was issued, energy efficient clothes washers had a market share of <1% and had some quality issues. Today

all the major domestic manufacturers offer qualifying products and Energy Star's market share for clothes washers is approximately 20% in many parts of the country.

For refrigerators, DOE set a level of 10% better than the new DOE standard. When issued, there were no qualifying models on the market. Since then, manufacturers have brought to market a wide range of qualifying models. Models that are 15 and 20% better than the DOE standard have recently been introduced. These two examples demonstrate the market pull that the Energy Star label can provide to those energy efficient products that use dramatically less energy than the current standard offerings.

b) The fundamental technologies needed to produce Energy Star complying products that meet the levels proposed by NRDC currently exist and are commercially available. For example, DOE has helped assist in the development of new heat pump water heater models. Gas condensing hot water heaters are already available from a limited number of suppliers and the demand created by the Energy Star label will increase their availability. Solar-based water heaters have been around for decades and the credibility of the Energy Star label will provide a boost to this market segment as well.

3. *By adopting the modified Option 4 proposed by NRDC, DOE will maximize the market transforming leverage of the Energy Star label and increase the probability of significant utility rebates.*

To gain the interest and financial commitments of utilities, the incremental savings offered by the Energy Star label compared to the base case must be significant. If Energy Star establishes a weak specification for water heaters, there is a high probability that utilities will choose: a) not to offer rebates, or b) to establish their own specifications at levels higher than Energy Star. As was seen for many Energy Star products, when DOE or EPA sets an appropriately strong spec the utilities will rally around it, and often offer significant rebates. The net result is much greater energy savings and increased market share for the more efficient models.

4. *In order to address potential quality concerns governing the new advanced technologies, DOE should consider adding some requirements to its spec*.

Some commenters are nervous about the track record of certain technologies, in particular heat pump water heaters. To satisfy that concern, we recommend DOE discuss possible options with the manufacturers, installers, etc to address this concern including the possible inclusion of a warranty requirement of x years. DOE has successfully taken this approach with compact fluorescent lamps (CFLs).

5. *Some electric resistance water heater manufacturers have stated that the replacement water heater market demands replacement within 24 to 48 hours of failure. They claim that the customer will likely simply want to replace their system with a like one, and they claim that we should make sure that all consumers have an Energy Star option*.

As stated previously for conventional electric storage water heaters, going from the standard of 0.90 EF to a slightly higher value provides the consumer with very little savings. It is our strong belief that Energy Star would be doing the consumer a disservice by creating the unmet expectation of noticeable energy savings by moving up to the Energy Star labeled product in this case.

Instead, we should be working to develop and support the infrastructure to meet the needs of the replacement market so that this consumer can easily obtain an installed heat pump water heater or other advanced technology in a timely manner. NRDC and other energy advocates are firmly committed to pursue the much larger energy savings that the new, dramatically more efficient products offer. The savings that would be achieved by simply moving the market share of these technologies to 10 or 20% of the overall market dwarfs the savings that could be gained by market adoption of the electric storage water heaters with EFs of .93.

If the consumer is insistent on having a conventional electric storage water heater installed, then they still can choose to do so. After all, Energy Star is a voluntary program and does not preclude the sale of the less efficient models and options.

6. *A significant share of the market does not operate on an emergency replacement scenario. It is therefore imperative to provide potential purchasers with sufficient information to make an informed decision.*

We must all remember that a significant part of the market continues to be new construction and upgrades/replacements not made in an emergency. If DOE were to set a specification that allowed conventional electric storage water heaters to qualify, this segment could receive an enormous unfair advantage. If a consumer simply looks at side by side electric resistance water heaters and they see the Energy Star label, they might choose to purchase it without recognizing or receiving the 5 to 10 fold larger savings that even a gas storage water heater *that fails to merit an Energy Star label* provides in a very cost-effective manner. In these cases we want to make sure the contractor/builder/home owner receives an Energy Star rated model that really does provide dramatic savings.